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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,644

06/20/2006

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EXAMINER

FANG, SHANE

ART UNIT

PAPER NUMBER

1796

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,644	AMISHIMA ET AL.	
	Examiner	Art Unit	
	SHANE FANG	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-17 is/are pending in the application.
- 4a) Of the above claim(s) 11-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-10 is/are rejected.
- 7) ☒ Claim(s) 2,7-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/18/06,01/16/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

WO 2001/051991 listed on ISP is used for 102s rejection.

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 2-10 drawn to polyamide acid resin containing unsaturated group by reacting polyol, dianhydride, and diamines

Group II, claim(s) 11-12 drawn to methods of producing polyamide acid as recited in Group I

Group III, claim(s) 13-17 drawn to a photosensitive resin composition containing polyamide acid as recited in Group I and a crosslinker, photo-initiator, and etc.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the common technical feature in all groups is the polyamide acid resin containing unsaturated group by reacting polyol, dianhydride, and diamines. This element cannot be a special technical feature under PCT Rule 13.2 because the element is shown in the prior art.

WO 2001/051991 (Abstract, listed in IDS and ISP) discloses a polyamide acid resin

obtained by reacting poly-unsaturated polyol with a diamine compound and a multi-basic acid anhydride having at least two acid anhydride groups..

A telephone call was made to Kevin S. Lemack on 04/06/2009 to request an oral election to the above restriction requirement. Group I (claims 1-10) is elected with traverse.

Claim Objections

1. Claim 2 is objected to because of the following informalities: "polyamide resin (A) in line 1 is recommended to be changed to "polyamide acid resin A", since this term was originally present in claim 2. Appropriate correction is required.
2. Claims 7-10 are objected to under 37 CFR 1.75(c) as being in improper form of multiple dependent claims. See MPEP § 608.01(n). For examination purpose, claims 7-10 are considered referred to claim 2.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2-8 are rejected under 35 U.S.C. 102(b) as being anticipated by **Koyanagi et al. (WO 0151991**, machine translation of JP 2001192431 is used as English equivalent) listed on IDS.

Koyanagi et al. discloses a polyamide acid in Ex. 2 and 3 ([0053-0054]) by reacting 3,4'-diaminophenyl ether as recited in claims 2 and 8, pyromellitic dianhydride

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as recited in claims 2 and 7, and an unsaturated polyol, which is a reaction product of Bisphenol A/F and acrylic acid as recited in claims 2-6. During the reaction, excessive dianhydride is used and result in an anhydride terminated polymer (Ex. 3). This implies the polyester, a reaction product of polyol and dianhydride, can have terminal anhydride group.

Koyanagi et al. is silent on forming the polyester first, then anhydride terminated polyester reacts with diamine to form polyamid acid. However, claim 2 is a product-by-process claims that are limited by and defined by the product. Determination of patentability is based on the product itself, not on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. **In re Thorpe**, 777 F. 2d 695, 698,277 USPQ 964,966 (Fed. Cir. 1985). See MPEP § 2113. In this particular case, the end product of polyamide acid disclosed by Koyanagi et al. (Ex. 2-3) appears to show no structural difference compared with the claimed invention.

Therefore, claims 2-8 are rejected.

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Koyanagi et al. (WO 0151991**, machine translation of JP 2001192431 is used as English equivalent) listed on IDS.

Disclosure of Koyanagi et al. is adequately set forth in paragraph 4 and is incorporated herein by reference.

Koyanagi et al. is silent on the values of equivalent ethylenic group and carboxyl group as recited in claims 9-10. However, the polyamide acid disclosed by Koyanagi et al. (Ex. 2-3) appears to show no structural difference compared with the claimed invention. Koyanagi et al. also discloses a process of producing polyamid acid using ratio of epoxy:acrylic acid =1:1 and excessive dianhydride over diamine (Ex.3 in reference and Ex. 1 in application). In view of the substantially identical composition, it appears that the adduct would have inherently possessed the claimed properties. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. **In re Best**, 562 F. 2d 1252, 195 USPQ 430 (CCPA 1977). See MPEP § 2112.

Claim Rejections - 35 USC § 103

7. Claims 2-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nomura et al. (US 5310862)** in view of **Nishikubo et al. (US 3923523)**.

Normura et al. discloses photosensitive polyimide precursor composition containing a poly(amic acid) (Abs.) by reacting diamine to a tetracarboxylic monoester monoanhydride, which is prepared by adding alcohol to a tetracarboxylic dianhydride (4:5-10) (to form a polyol). The tetracarboxylic dianhydride can be pyromellitic

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dianhydride (4: 36-37) as recited in claims 2 and 7. The diamine can be 4,4'-diaminodiphenylmethane (5: 20-21) as recited in claims 2 and 8. The example of alcohol is a (meth) acrylic acid ester (actually a polyol) wherein the ester has an alcoholic hydroxyl group can afford a photosensitive polyimide precursor superior in photosensitivity (5: 1-4). The resultant polyamic acid is actually a polyamid acid.

Normura et al. is silent on polyester by reacting (meth)acrylic acid with epoxy to form a polyol as recited in claims 2-6.

Nishikubo et al. discloses a polyester obtained from a poly-ol having a photopolymerizable unsaturated ester group and a polycarboxylic acid anhydride such as pyromellitic acid dianhydride (Abs.) The polyol is formed by reacting Bisphenol A and acrylic acid (2:22-25) to form a photopolymerizable α , β -unsaturated ester group (2:12-3), then polyol is reacted with equal moles of pyromellitic acid dianhydride to form polyester (Ex. 1). Since the pyromellitic acid dianhydride: polyol=1:1 (Ex. 1), the resultant polyester would be terminated by anhydride groups, as shown in the instant Ex. 1, where epoxy:acrylic acid: pyromellitic acid dianhydride=1:1:1.

Nishikubo et al. further discloses the resultant photopolymerizable polyester can be overcome disadvantages of low curing speed and low crosslinking speed (1:45-47, 26-40) that is observed in unsaturated polyester (1:10-15), due to the photopolymerizable α , β -unsaturated ester group (acrylate group, 2:12-3) in photopolymerizable polyester.

Nishikubo et al. teaches an equivalent method of forming polyols having good photopolymerizability having (meth)acrylate group as one intermediate to form

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polyamide acid. In light of this, as to claims 2-8, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modify to polyamid acid disclosed by Normura et al. and use the polyol obtained by reacting Bisphenol A with acrylic acid, because the resultant polyamid acid and have better curing and crosslinking speed. This adaptation would have obviously yielded instantly claimed invention.

As to claims 9-10, Normura et al. and Nishikubo et al. are silent on the values of equivalent ethylenic group and carboxyl group. However, one ordinary skill in the art would have expected the product disclosed by Normura et al. and Nishikubo et al. to feature the same properties, because both references obviously satisfy all of the material and chemical limitations of the instant invention-see MPEP 2112.01.

Conclusions

Affirmation of this election must be made by applicant in replying to this office action. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even through the requirement be traversed (37 CFR 1.143).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHANE FANG whose telephone number is (571)270-7378. The examiner can normally be reached on Mon.-Thurs. 8 a.m. to 6:30 p.m. EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sf

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796